PROGRAM CHARTER FOR
THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTATION (NOAA)
UNMANNED AIRCRAFT SYSTEMS (UAS) PROGRAM

EXECUTIVE SUMMARY

Numerous legislative acts call for the advancement of technologies to better observe, understand and anticipate changes in climate, weather, oceans, and coasts; and to better monitor and manage marine resources. These requirements drive the National Oceanic and Atmospheric Administration (NOAA) to develop optimized observing strategies utilizing innovative observing systems and products that can address critical information needs or gaps that can be operated safely and feasibly with cost-effective life cycle support and that can maximize cross-cutting benefit to the NOAA mission.

NOAA's Next Generation Strategic Plan (NGSP) recognizes the importance of earth observations to the NOAA mission of science, service, and stewardship. Accordingly, it sets a five-year objective for more reliable, accurate, and integrated earth observations for NOAA's Enterprise Science and Technology. It also emphasizes that the growing NOAA requirements for observations greatly exceed the capacity of current NOAA observing assets. Thus there is a critical need to maintain the balance of observation continuity while implementing efficient emerging technologies. The NGSP specifically recognizes unmanned air and water vehicles as emerging capabilities which can strengthen NOAA's observation of hard-to-reach regions of the Earth such as the Arctic and remote ocean areas.

The NOAA UAS Program was established to examine innovative UAS technologies and observations, to incubate UAS applications beneficial to the NOAA mission, and to integrate UAS observing strategies into the NOAA research and operational Earth observing framework. The NOAA UAS Program will evaluate the feasibility of UAS technologies to address the NOAA mission using a requirements-based systems approach in partnership with the Office of Marine and Aviation Operations and the NOAA Line Offices. The NOAA UAS Program will be managed by the Office of Oceanic and Atmospheric Research and will maintain regular communication with the NOAA Research Council, Observing Systems Council, Fleet Council, Line Office Transition Management Committee, and Technology Integration and Planning Office to ensure Program priorities are aligned with Agency goals.

PROGRAM VISION

UAS will begin to revolutionize NOAA observing strategies by 2014 with new, innovative capabilities as revolutionary as the introduction of satellite and radar assets decades earlier.

PROGRAM MISSION

UAS have the potential to efficiently and safely bridge critical information gaps in data sparse and remote locations of the global environment and advance the understanding of key processes in Earth systems. Optimizing the capabilities that UAS offer will advance NOAA's mission goals through improved understanding of oceanic and atmospheric exchanges, hurricanes, wildfires, marine ecosystems, Polar Regions, hazards, and other environmental and ecological processes, ultimately leading to improved climate and weather predictions, and management of marine resources. NOAA is partnering with other civilian agencies, industries and academic communities to develop UAS operations, systems and platforms that can be safely deployed, both nationally and globally, to fill observational data gaps with increased efficiency and decreased risk to personnel.

PROGRAM DRIVERS

NEXT GENERATION STRATEGIC PLAN

NGSP LONG-TERM GOALS

The NOAA UAS Program will directly support the NGSP long-term goals by improving the reliability, accuracy, and integration of observations needed for the NOAA mission of science, service, and stewardship. The NOAA UAS Program will target UAS technologies and observations which provide measurable progress towards the achievement of the NOAA long-terms goals of:

- Climate Adaptation and Mitigation - An informed society anticipating and responding to climate and its impacts
- Weather-Ready Nation - Society is prepared for and responds to weather-related events
- Healthy Oceans - Marine fisheries, habitats, and biodiversity are sustained within healthy and productive ecosystems

- Resilient Coastal Communities and Economies - Coastal and Great Lakes communities are environmentally and economically sustainable.

NGSP PERFORMANCE OBJECTIVES:

The UAS Program will seek to directly impact the following specific subset of NGSP performance objectives through improved NOAA observing strategies using UAS technologies and observations:

- Climate Adaptation and Mitigation
  - Improved scientific understanding of the changing climate system and its impacts
  - Integrated assessments of current and future states of the climate system that identify potential impacts and inform science, services, and decisions
- Weather-Ready Nation
  - Reduced loss of life, property, and disruption from high-impact events
  - Improved transportation efficiency and safety
- Healthy Oceans
  - Recovered, rebuilt, and sustained living marine resources
  - Healthy habitats that sustain resilient and thriving marine resources and communities
- Resilient Coastal Communities and Economies
  - Resilient coastal communities that can adapt to the impacts of hazards and climate change
  - Comprehensive ocean and coastal planning and management
  - Safe, efficient and environmentally sound marine transportation
  - Safe, environmentally sound Arctic access and resource management

NGSP SCIENCE AND TECHNOLOGY ENTERPRISE OBJECTIVES:

The NOAA UAS Program will directly support or implement the following NGSP enterprise objectives:

- NOAA's Science & Technology Enterprise
  - A holistic understanding of the Earth system through research
  - Accurate and reliable data from sustained and integrated earth observing systems
  - An integrated environmental modeling system
- NOAA's Engagement Enterprise

    - An engaged and educated public with an improved capacity to make scientifically informed environmental decisions
    - Integrated services meeting the evolving demands of regional stakeholders
- NOAA's Organization & Administration Enterprise
    - Diverse and constantly evolving capabilities in NOAA's workforce
    - A modern IT infrastructure for a scientific enterprise
    - Sound, life-cycle management of capital investments

NOAA STRATEGIC INITIATIVES AND POLICY DRIVERS

The NOAA UAS Program will assist the Agency in meeting the information requirements necessary for the goals and objectives of NOAA strategic initiatives and policy drivers including:

- The Final Recommendations of the Interagency Ocean Policy Task Force released by the White House Council on Environmental Quality on 19 July 2010, highlights ocean, coastal, and Great Lakes observations, mapping, and infrastructure as one of nine national priority objectives of the National Ocean Policy. These recommendations include fully integrating ground-breaking observation technologies to observe and study global processes at all scales as a key opportunity. "The use of unmanned vehicles and remote sensing platforms and satellites to gather data on the health and productivity of the ocean, our coasts, and the Great Lakes" is specially identified as an area to be addressed during the development of the future strategic plan for the National Ocean Policy.
- NOAA's Arctic Vision and Strategy provides a high-level framework and six strategic goals to address these emerging issues and stakeholder requirements in the region. These strategic goals are:
    - Forecast Sea Ice
    - Strengthen Foundational Science to Understand and Detect Arctic Climate & Ecosystem Changes
    - Improve Weather and Water Forecasts and Warnings
    - Enhance International and National Partnerships
    - Improve Stewardship and Management of Ocean and Coastal Resources in the Arctic
    - Advance Resilient and Healthy Arctic Communities and Economies
- The NOAA National Weather Service Strategic Plan 2011– 2020 describes a future emphasis on impact-based decision support services in order to meet society's new and evolving needs. Future forecasters will be expected to focus

more on "maintaining continuous situational awareness, interpreting information and providing decision support for high-impact events" and less on fine-tuning the accuracy of model output. Integrated four-dimensional weather, water, climate, and environment observations and forecasts will be essential along with other scientific and technical advancements such as next-generation observations and Earth system models at all possible spatial and temporal scales.

- The National Hurricane Operations Plan and the National Winter Storms Operations Plan requires NOAA provide weather reconnaissance flights, including synoptic surveillance in order to ensure the necessary preparedness actions are taken to minimize loss of life and destruction of property.
- The First U.S. Integrated Ocean Observing System (IOOS) Development Plan – A Report of the National Ocean Research Leadership Council and the Interagency Committee on Ocean Science and Resource Management Integration (January 2006) provides a framework for the development of an IOOS and its improvement through enhancements and research
- Interagency Oceans and Human Health Research Implementation (OHHI) Plan: A Prescription for the Future by the Interagency Working Group on Harmful Algal Blooms, Hypoxia, and Human Health (Joint Subcommittee on Ocean Science and Technology, 2007). The OHHI identified six implementation actions to advance OHH research and application, leading to reduced health risks and increased health benefits for people. Action 3, support research infrastructure, specifically includes ocean observing and infrastructure to enable data sharing and integration.

NOAA LEGISLATIVE DRIVERS:

The NOAA UAS Program will assist the Agency in meeting the information requirements of NOAA legislative drivers including:

- 15 USC § 313, the "National Weather Service Organic Act" directs the National Weather Service to forecast the weather, issue storm warnings, collect and transmit marine intelligence for the benefit of commerce and navigation, report temperature and rainfall conditions, and take such meteorological observations as may be necessary to establish and record the climate conditions of the United States.
- 15 USC § 313c, the "Inland Flood Forecasting and Warning System Act of 2002" authorizes NOAA through research, modeling, training, and outreach to enhance

the capability to accurately forecast inland flooding, including flooding caused by coastal and ocean storms.

- 49 USC § 1463, the "Federal Aviation Act" directed the National Weather Service to make "observations, measurements, investigations, and studies of atmospheric phenomena, and establish such meteorological offices and stations, as are necessary or best suited for ascertaining, in advance, information concerning probable weather conditions."
- 33 USC § 17, the "National Ocean Survey" requires NOAA to acquire shoreline topographic data, promulgate standards, products and services for charts and related information for the safe navigation of marine and air commerce as well as basic data for engineering, scientific and commercial purposes.
- 42 USC § 85, the "Air Pollution Prevention and Control" requires NASA and NOAA to monitor and report to Congress on the current average tropospheric concentration of chlorine and bromine and on the level of stratospheric ozone depletion.
- 15 USC § 2921 et. seq., the "Global Change Research Act" provides for a research program which to obtain global measurements, establishing worldwide observations necessary to understand the physical, chemical, and biological processes responsible for changes in the Earth system on all relevant spatial and time scales.
- 16 USC § 31, the "Marine Mammal Protection", § 35 "Endangered Species", and § 38 "Fishery Conservation and Management" make NOAA's National Marine Fisheries Service responsible for protecting, restoring, and management species listed under the Endangered Species Act and Marine Mammal Protection Act.
- 16 USC § 1801 et. seq., the "Magnuson-Stevens Fishery Conservation and Management Act" declares that the collection of reliable data is essential to the effective conservation, management, and scientific understanding of the fishery resources of the United States; and that habitat … should receive increased attention for the conservation and management of fishery resources of the US.
- 41 CFR § 102–33, Management of Government Aircraft, which describe how to "acquire, manage, and dispose of Government aircraft (*i.e.,* Federal aircraft and commercial aviation services (CAS); as safely, efficiently, and effectively as possible consistent with the nature of your agency's aviation missions."

PROGRAM GOALS

The NOAA UAS Program will pursue three primary goals in order to fulfill its vision and mission.

- Goal 1: Increase access to UAS technologies and observations for the NOAA science community through investments, acquisitions, and partnerships based on safe, efficient and cost-effective operational practices.

- Goal 2: Apply UAS technologies and observations to focused missions with high scientific return and measurable progress of advancing technology readiness toward integration into routine research and operational applications. Program priorities will begin in 2012 with development of research and operational UAS missions for improved high impact weather, polar, and marine monitoring. Other mission priorities may be added at a later date depending on the evolving observing needs of the Agency.

- Goal 3: Proactively engage stakeholders from across the NOAA enterprise and externally to ensure the NOAA UAS Program is continually and adequately addressing the NOAA observing strategies needed to support the NOAA mission of science, service and stewardship.

PROGRAM OUTCOME

The NOAA UAS Program will deliver optimized information system solutions based on UAS technologies and observations which demonstrate science traceability to the goals of the Agency and measurable benefit to the NOAA mission as these solutions are transitioned into routine research or operational applications.

PROGRAM BENEFICIARIES

The optimized UAS information system solutions delivered by the NOAA UAS Program will have cross-cutting benefit across research and operational activities of all NOAA Line Offices when aircraft capabilities are needed for longer endurance, lower flight altitudes, quieter noise performance, and easier transportability than manned aircraft options. Depending on the application, these UAS solutions may also offer higher spatial and temporal resolution observations than satellites or broader spatial coverage than surface observing platforms positioned at fixed locations. NOAA leadership in transitioning UAS technologies and observations into civil applications will demonstrate the viability of UAS technologies for commercial markets and employment opportunities benefiting both private industry and academia.

PROGRAM ROLES AND RESPONSIBILITIES

The NOAA UAS Program was established to examine innovative UAS technologies and observations, to incubate UAS applications beneficial to the NOAA mission, and to

integrate UAS observing strategies into the NOAA research and operational Earth observing framework. The NOAA UAS Program will evaluate the feasibility of UAS technologies to address the NOAA mission using a requirements-based systems approach. This includes: researching Agency information requirements and technology capabilities, acting as the NOAA science and technology conscience during the identification of promising UAS technologies and observations, and leading the development, acquisition and transition efforts of UAS technologies and observations into routine NOAA application in a timely and economical fashion. This also includes support for the regional partners through its cooperative institutes. Operational transition efforts will follow the NOAA Policy on Transition of Research to Application (NOAA NAO 216-105) and be closely coordinated with the NOAA Line and Staff Offices.

The NOAA UAS Program will be managed and resourced by the Office of Oceanic and Atmospheric Research in partnership with the Office of Marine and Aviation Operations and the NOAA Line Offices. The Program will follow project management practices established in the NOAA Business Operations Manual (BOM). The NOAA UAS Program will be led by a Program Director reporting to the OAR Deputy Assistant Administrator for Laboratories and Cooperative Institutes. The NOAA UAS Program Director will have overall responsibility for the development, execution and oversight of the UAS Program strategic direction and investments. The NOAA UAS Program Director will manage fiscal and staff resources, formulate and execute the UAS Program Budget and Annual Operating plans, and report plans, milestones, and results to NOAA management. The NOAA UAS Program Director will maintain regular communication with the NOAA Research Council, Observing Systems Council, Fleet Council, Line Office Transition Managers, and Technology, Planning, and Integration for Observations Program to ensure NOAA UAS Program priorities are aligned with Agency goals.

PROGRAM STAKEHOLDERS AND PARTNERSHIPS

INTERNAL NOAA STAKEHOLDERS

The NOAA UAS Program will respect the roles and responsibilities of all NOAA Corporate, Line and Staff Offices outlined in the NOAA BOM. The NOAA UAS Program will also build the following specific relationships to address NOAA UAS issues:

NOAA LABORATORIES AND COOPERATIVE INSTITUTES

The NOAA UAS Program will solicit UAS science and technology ideas, impact studies, evaluations and recommendations from NOAA Laboratories and cooperative institutes to ensure proposed UAS information system solutions are aligned with OAR research goals and objectives as well as Line Office needs. NOAA Laboratories and cooperative institutes will assist the NOAA UAS Program in identifying promising UAS technologies and observations suitable to serve the NOAA mission and in incubating the readiness of UAS technologies and observations for transitioning into routine research and operational application.

NOAA LINE OFFICES AND LINE OFFICE TRANSITION MANAGERS

The NOAA UAS Program will solicit UAS science and technology ideas, evaluations, and proposed concept of operations from all Line Offices and Line Office Transition Managers to ensure UAS information system solutions are aligned with Line Office needs. The Line Offices Transition Managers will assist the UAS Program by disseminating information regarding UAS technologies and observations to Line Office personnel, assisting in the development of performance requirements for UAS information system solutions and collaborating to secure funding for UAS operations after research transition.

NOAA TECHNOLOGY, PLANNING, AND INTEGRATION FOR OBSERVATIONS PROGRAM

The NOAA UAS Program will coordinate UAS observing and performance requirements with the NOAA Technology, Planning, and Integration for Observations Program (TPIO). The NOAA TPIO will assist the NOAA UAS Program with verification and validation of these requirements by disseminating information from the NOAA Consolidated Observation Requirement List, the NOAA Observing System Portfolio Analysis, the NOAA Observing System Architecture, and the Information Management System Inventory and the Global Earth Observation-Integrated Data Environment.

NOAA OFFICE OF MARINE AND AVIATION OPERATIONS

The NOAA UAS Program will coordinate the following activities with OMAO to ensure all UAS operations are evaluated for safety, cost effectiveness, and operational feasibility before deployment:

- NOAA-sponsored UAS science and technology demonstrations and field operations,
- Systems engineering and business case analyses of UAS technologies
- UAS acquisition recommendations

UAS acquisitions will be Agency assets. OMAO will be the Agency custodian of all UAS assets and will be responsible for the safe and efficient operation and maintenance of UAS in accordance with NOAA Policy for Management and Utilization of Aircraft (NAO 216-104). OMAO will:

- Maintain operational authority over NOAA UAS to ensure safe, efficient, and consistent use of resources
- Provide logistical, technical and administrative support necessary for the successful accomplishment of NOAA UAS schedules
- Approve changes to UAS schedules in conjunction with the UAS Program Director provided the general intent of the original allocation is not significantly changed
- Represent NOAA on external and interagency groups in the area of aircraft management
- Approve, by waiver, deviations from policies regarding the qualifications of UAS operators, maintenance personnel, and other crew members as set forth in the NOAA Aircraft Operations Center Flight Operations Manual
- Administer policy and guidelines for the management and use of NOAA UAS
- Obtain the required clearances from the Federal Aviation Authority for NOAA UAS operations in national air space
- Obtain the required clearances from foreign government(s) through the Department of State for NOAA UAS operations abroad
- Develop policies governing the management of NOAA UAS, standard operating procedures, aviation personnel, and related matters
- Perform technical assessment and evaluation of proposed acquisitions, classifications, assignments and dispositions of NOAA UAS
- Assess UAS airworthiness and provide for continuing airworthiness

NOAA RESEARCH, OBSERVING SYSTEM, AND FLEET COUNCILS

The NOAA UAS Program will provide regular updates to the NOAA Research, Observing System and Fleet Councils regarding the Program strategic priorities and acquisition recommendations. The NOAA Research, Observing System and Fleet Councils will provide guidance and decisional support for NOAA UAS Program priorities and acquisition recommendations.

NOAA UNMANNED SYSTEMS WORKING GROUP

The NOAA UAS Program will collaborate with the NOAA Unmanned Systems Working Group to document, plan, and advocate the utilization of unmanned, autonomous, robotic, remotely piloted, and animal-borne observing systems to meet NOAA observing needs or gaps when high scientific return may be accomplished with safe, feasible, and cost-effective operations.

EXTERNAL NOAA PARTERSHIPS

FEDERAL AGENCIES AND INTERAGENCY UAS WORKING GROUPS

The NOAA UAS Program will share UAS technologies and information, strategic and operating plans, observing and performance requirements, technology assessments, impact studies, system and business case analyses, and lessons learned with other Federal agencies and interagency UAS working groups when taking advantage of economies of scale, avoiding duplication of effort, and sharing national air space are in the best interest of the Government and the NOAA mission.

PRIVATE INDUSTRY AND ACADEMIA

The NOAA UAS Program will solicit UAS technology information and proposal ideas from private industry and academia to ensure UAS information system solutions are state-of-art, safe, feasible, and cost-effective for NOAA research and operational applications. Private industry and academia will assist the NOAA UAS Program in identifying promising UAS technologies and observations suitable to serve the NOAA mission and in incubating the readiness of UAS technologies and observations for transitioning into routine research and operational application.

INTERNATIONAL PARTNERS

The NOAA UAS Program will collaborate with international UAS working groups to coordinate and advocate the utilization of UAS for scientific observation. The NOAA

UAS Program will assist NOAA in jointly collecting and sharing UAS observations with international partners pertaining to science topics of international interest and concern.

MEMORANDUM FOR: NOAA Program Managers, Laboratories,
Science Centers and Cooperative Institutes

FROM Robbie E. Hood
NOA A Unmanned Aircraft Systems Program Manager

SUBJECT: FY2012 NOAA Unmanned Aircraft Systems Call for Proposals

The NOAA Unmanned Aircraft Systems Program (UASP) is requesting proposals from NOAA programs, laboratories, science centers, cooperative institutes and others for funding science objectives identified in NOAA's Next Generation Strategic Plan. The overall objective of the solicitation is to makes advances in Earth systems science through innovative UAS enabled investigations. It is the policy of NOAA's UASP to seek full and open competition among NOAA personnel and cooperative institutes for the award of discretionary funds. Discretionary financial assistant is awarded through a merit-based review and selection process

The UASP applies a rigorous, competitive, review process to select research projects. The review process is extensive and documented, to make it as transparent as possible to applicants. UASP assures that this quest for quality science carries through the entire project from concept to final products by including peer- and system reviews at all critical levels, seeking the advice of external experts, and initiating regular reviews of the project.

For the FY2012 initial UAS solicitation, the emphasis will be on low altitude marine and wildlife assessments. Platforms of preference will be NOAA owned UAS such as the Puma, md4-1000 quadrocopter and the Manta. Other proposals will also be considered with focus on the NOAA mission areas of High Impact Oceanic Weather (Tropical Cyclones, Atmospheric Rivers, and Pacific Winter Storms), Arctic Sea Ice and Climate Change, and Marine Monitoring.

The specific details of this call for proposals is attached with this memorandum and additional guidance for proposal submittals can be found on the NOAA UAS website http://uas.noaa.gov, *Unmanned Aircraft Systems, Competitive Award Process, A Manual of Procedures.*

Cc: List program managers
Laboratories
Science Centers
Cooperative Institutes
Sanctuary Managers

FY 2012 Call for Proposals Supporting NOAA's Mission Goals using Unmanned Aircraft Systems (UAS) Technology

- 7 Dec 2011 – Call for FY12
- 11 Jan 2011 – Deadline for pre-proposals
- 13 Feb 2011 – Request for full proposals
- 26 Mar 2011 – Deadline for full proposals
- 24 Apr 2011 – Proposal selection

NOAA UAS POC

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1.0 Introduction

Unmanned Aircraft Systems (UAS) have the potential to efficiently, economically and safely bridge critical information gaps in data sparse and remote locations of the global environment and advance the understanding of key processes in Earth systems. Optimizing the capabilities that UAS offer will advance NOAA's mission goals through improved understanding of oceanic and atmospheric exchanges, hurricanes, wildfires, marine ecosystems, polar regions, hazards, and other environmental and ecological processes, ultimately leading to improved climate and weather predictions and management of marine resources. NOAA is partnering with other civilian agencies, industry and the academic community to develop UAS operations, systems and platforms that can be safely deployed both nationally and globally, to fill observational data gaps with increased efficiency and decreased risk to personnel.

2.0 Scope of the Solicitation

The NOAA Unmanned Aircraft Systems Program has identified and demonstrated promising unmanned observing technologies which have the potential to bring measurable benefit to the NOAA mission critical observing strategies through improved observing capabilities, decreased cost, enhanced operational efficiencies, or reduced risk to personnel. The advantages of UAS technologies are especially promising in the mission areas of high impact weather, polar, and marine monitoring which:

- Require observation data over distant regions or at temporal frequencies that are not available from manned aircraft observations and satellites, and
- Pose safety risks to manned aircraft crews due to the dangerous environments

The NOAA Unmanned Aircraft Systems Program now solicits competitively selected field projects which will advance the technology readiness of unmanned systems even further toward feasible routine research or operational applications. For this initial UAS solicitation, the focus will be on proposals that emphasize low altitude or short endurance marine and wildlife assessments with platforms currently or soon to be in the NOAA fleet. The platforms include the md4-1000 quadrocopter, Manta UAS, and SkyWisp balloon launched glider as well as the Puma UAS, which is expected to be procured in the winter 2012. This list does not preclude consideration of other air vehicles or other science topics as long as the proposed field project directly addresses the NOAA observing needs of the NOAA mission goals outlined in the NOAA Next Generation Strategic Plan.

3.0 Science Objectives and Goals

The overall objective of this solicitation is to make advances in Earth system science through innovative UAS-enabled science investigations that focus on the NOAA mission areas. Investigations must be relevant to the science priorities, goals, and objectives of NOAA's Next Generation Strategic Plan. Investigation goals could include but are not limited to:

- Providing real-time information to improve situational awareness or input for operational models
- Making measurements that address weaknesses in current Earth system models leading to improvement in modeling capabilities;
- Producing data sets that identify, characterize, and assess important phenomena
- Detecting and characterizing changes in the Earth system
- Monitoring and managing living marine resources and habitat.

4.0 Description of Solicited Research

The science objectives of the field project will be determined by the proposers, consistent with the goals and objectives identified in NOAA's Next Generation Strategic Plan.

Proposals are expected to:

1. Meet science objectives through measurements sufficient and necessary to prove/disprove a scientific hypothesis or address scientific questions.
2. Plan and conduct scientific measurements utilizing currently available sensors and instrumentation to meet science objectives. It is not appropriate to propose for significant new instrument development under this call. However, consideration will be given for modifications and improvements to existing instruments as may be required to address science goals.
3. Deliver the following:
    a. Science Report with analysis of data, report on science objectives, and at a minimum a draft of publication results

b. Technology Assessment Report with analysis of UAS performance and report on vehicle/system considerations or modifications that would be required to accommodate science objectives.

The complete investigations requested by this solicitation shall include provision for:

- access to required UAS platforms,
- any required upgrades to platforms to enable the science mission
- all phases of any required instrument adaption and integration of instrument(s) onto the UAS platforms,
- investigation operations,
- data analysis,
- data distribution and data archival in a NOAA-assigned data center within 6 months from the end of the science mission,
- publication of science results,
- project management,
- logistics,
- travel,
- shipping,
- any proposed partnering arrangements, either domestic or international, and science team.

Successful responses to this solicitation must specify and justify the scientific scope and objectives of the proposed investigation, the full instrument suite to be assembled, the investigation platform and any upgrades, and the experimental approach to be pursued for data acquisition as well as for scientific analysis.

5.0 Programmatic Requirements

4.1 Funding

The proposal will be funded by FY 2012 funding and all funding must be fully obligated by September 30, 2012, with performance complete by September 30, 2013

4.2 Awards

Three to five investigations may be selected depending on the availability of proposals of appropriate merit, provided they can be accommodated within the total budget profile allocated for this solicitation. A total of $600K is being allocated for proposals under this solicitation. Proposals with international deployments or budgets exceeding $300K are discouraged for this solicitation. These types of proposals may be more appropriate for a second UAS solicitation with a broader science focus expected to be released in the spring of 2012. This solicitation also seeks to make one to two micro-awards of less than $50K each. NOAA reserves the right to make no selection if no proposals of appropriate merit are submitted or if FY12 funding is not dispersed as expected.

4.3UAS Platforms

UAS platform selection will be at the discretion of the PI but consideration will be given to platforms now owned and operated by NOAA or planned to be acquired in FY2012.

4.3 Excess Capacity in Selected Investigations

NOAA UAS Program reserves the right to utilize excess capacity in selected projects. NOAA might add measurements, flight hours, sampling locations and/or times, etc. to any selected and funded project. Any additions will be coordinated with the PI, and negative impacts will be minimized. Any costs associated with these additions will be covered by NOAA outside of the funding of any project selected as part of this solicitation.

EVALUATION CRITERIA
FY 2012 CALL FOR PROPOSALS SUPPORTING NOAA'S MISSION GOALS USING UNMANNED AIRCRAFT SYSTEMS (UAS) TECHNOLOGY

Appendix B.1- INSTRUCTIONS FOR REVIEWERS

Please provide both written comments and a summary rating on the Proposal Evaluation Form by employing the criteria provided below.

Proposal Evaluation Criteria:
We ask reviewers to use the following five criteria when evaluating a proposal:

1. **Importance and/or Relevance and applicability of proposed project to the program goals: (35 percent):** This ascertains whether there is intrinsic value in the proposed work and /or relevance to NOAA, federal, regional, state or local activities. For the purposes of this competition, successful responses to this solicitation, investigations must be relevant to the science priorities, goals, and objectives of NOAA's Next Generation Strategic Plan. This should include an assessment of whether the research addresses documented end user needs, and evaluation of information and technology transfer plans and activities. A significant component of this criterion includes the degree to which the proposed work will develop outcomes leading to improved environmental, management practices.

2. **Technical/scientific merit (35 percent):** This assesses whether the approach is technically sound and/or innovative, if the methods are appropriate, and whether there are clear project goals and objectives. For the purposes of this competition, successful responses to this solicitation must specify and justify the scientific scope and objectives of the proposed investigation, the full instrument suite to be assembled, the investigation platform and any upgrades, and the experimental approach to be pursued for data acquisition as well as for scientific analysis. Proposals should identify required analysis and or results to demonstrate advances in technology readiness levels.

3. **Overall qualifications of applicant (15 percent):** This ascertains whether the applicant possesses the necessary education, experience, training, facilities, and administrative resources to accomplish the project. For the purposes of this competition, successful responses to this solicitation do not need to have previous experience with UAS but should be familiar with the particular field of study. Partnership with other investigators familiar with UAS operations is recommended, and includes the capability of the investigator and collaborators to complete the proposed work as evidenced by past research accomplishments, previous cooperative work, timely communication, and the sharing of findings, data, and other research products.

4. **Project costs (15 percent):** The budget is evaluated to determine if it is realistic and commensurate with the project needs and time-frame. For the purposes of this competition, no single funding request will be considered in excess of $300K.

Ranking should take the form of written comments on the above criteria, with an overall rating having the following characteristics:

- **Excellent:** Probably will fall among the top 10% of proposals in the subfield; highest priority for support. This category should be used only for truly outstanding proposals.
- **Very Good:** Probably will fall among the top 1/3 of proposals in the subfield; should be supported.
- **Good:** Probably will fall among the middle 1/3 of proposals in the subfield; worthy of support.
- **Fair:** Probably will fall among the lowest 1/3 of proposals in the subfield; should not be supported without serious revision.
- **Poor:** Proposal has serious deficiencies; should not be supported.

Appendix B.2 - PANEL REVIEW EVALUATION FORM

A. Proposal Information:

Principal Investigator:	**Panelist ID:**
Institution:	**Proposal Number:**
Proposal Title:	

B. Proposal Evaluation:

For details see "Instructions for Reviewers." Note: boxes will adjust in size as appropriate.

Please evaluate this proposal using the following five criteria.
1. Importance and/or Relevance and applicability of proposed project to the program goals: (XX percent):
2. Technical/scientific merit (XX percent):
3. Overall qualifications of applicant (XX percent):
4. Project costs (XX percent):
5. Other (XX percent):
Additional Comments:
Rating: ☐ Excellent (5) ☐ Very Good (4) ☐ Good (3) ☐ Fair (2) ☐ Poor (1)
Verbatim but anonymous copies of reviews, ratings, and associated correspondence will be sent to the principal investigator. Subject to this policy and applicable laws, including the Freedom of Information Act (USC 552), reviewers' comments and identities will be given maximum protection from disclosure.

National Oceanic and Atmospheric Administrative Unmanned Aircraft Systems Competitive Award Process

A Manual of Procedures

Version last updated September, 2011

Unmanned Systems Program
Earth System Research Laboratory
Office of Oceanic and Atmospheric Research
National Oceanic and Atmospheric Administration

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ADMINISTRATIVE PROCEDURES FOR COMPETITIVE AWARD FOR PROJECT PROPOSALS

It is the policy of the National Oceanic and Atmospheric Administration's (NOAA), Unmanned Aircraft Systems Program (UASP), to seek full and open competition among NOAA personnel and cooperative institutes for the award of discretionary funds. Discretionary financial assistance is awarded through a merit-based review and selection process whenever possible. This document covers the financial assistance for awards process, with the exclusion of grants which will be administered as outline in the Department of Commerce Grants and Cooperative Agreement Interim Manual. See Appendix A.1 for a brief outline of funding mechanisms.

The UASP will maintain the program objectives to fund the best science that develops and improves NOAA capacities and capabilities for managing the use of UAS within NOAA and the Nation. The UASP also supports efforts to translate the results of its research investments, and those of others, into accessible and useful information for the nation's environmental managers and decision makers.

UASP applies a rigorous, competitive, review process to select research projects. The review process is extensive and documented, to make it as transparent as possible to applicants. UASP assures that this quest for quality science carries through the entire project from concept to final products by including peer- and system reviews at all critical levels, seeking the advice of external experts, and initiating regular reviews of the programs. Through this rigorous process, involving Federal and academic researchers, UASP is able to combine the best science in NOAA with the best in the research community (including universities, non-profit laboratories, commercial entities and institutions) to address issues with respect to UAS utilization.

PROPOSAL PROCESS

Request for proposals (RFP) are developed from the research priorities established by the UASP. The UAS Program Manager (PM) will identify critical science and management needs. The PM will provide the project description, priorities and objectives, evaluation criteria to be used, closing date, projected start date, and the funding availability to the UAS Project Review Team (PRT) Panel. The PRT will review all proposals and rank them according to the evaluation criteria established by the UAS PM. The evaluation criteria are also posted on the UAS Sharepoint and UAS public website.

The proposal process begins with publishing the RFP. The UASP will distribute these announcements though the Line Office Transition Mangers, UAS Team Members, and the UAS Website as well as to external partners and stakeholders. Applicants must send in proposals before the published deadline by electronic copy to the UAS PM. Proposals for the UASP project investments will be submitted in accordance with the following instructions.

Pre-Proposal Letter

A pre-proposal letter will be requested by the UAS PM before full proposals are requested. The purpose of the pre-proposal letters is to allow investigators to submit their ideas for the UASP to evaluate, provide technical feedback and indicate whether investigators will be encouraged to submit full proposals. The letter should include:

1. Contact information for the principal and co-investigators, including full mailing address, email address and phone number for each;
2. A maximum 3-page synopsis of the proposed research, including a rationale, questions and/or hypotheses to be addressed, the methods to be used, and anticipated results. Think of this as the Executive Summary of a full proposal. A description of the role of each investigator should also be included in the three pages.
3. Investigators should focus on what is new, groundbreaking or potentially transformative about the proposed research to investigate the use UAS technology for potential NOAA application.
4. Investigations must be relevant to NOAA's science priorities, goals, and objectives. Applicants should make a statement of how the work will be relevant to NOAA and show a linkage to NOAA's mission.
5. No more than one additional page describing the estimated budget, with approximate cost per year up to a maximum of three years. Any major equipment procurements or unusual costs, e.g., ship, aircraft, computers should be identified.
6. Up to one additional page of relevant references to the literature.
7. A 1-page biographical sketch for the principal investigator and primary co-investigators, with a focus on research activities and publications relevant to the proposed research.

Full Proposal Format for UASP Projects

After review and evaluation of pre-proposal letters and a determination has been made by the UASP for further consideration, a request will be made to the investigator to submit a full proposal. The full proposal will cover the following areas:

Project Abstract - Describe the project plan in no more than 500 words. The project abstract should include: (a) objectives and benefits; (b) an outline of the proposed work and methodology; (c) the period of performance.

Project Objective – Describe the project operating plan for the proposed period of performance and a longer term strategic plan for research to operations transition. Provide a statement of work that concisely describes each task or milestone to be accomplished in the course of the research and/or development activity. Define the success criteria associated with each task or milestone.

Expected Significance – Describe the expected significance of the project to the UASP, to the NOAA Strategic Plan, and the OAR Strategic Plan or relevant Line Office Strategic Plans.

Technical Plan – Describe the science and technical plan of the proposed project. The proposed plan could include (1) laboratory and/or field demonstration of UAS payloads, platforms, or concept of operations in relevant and/or operational environments, (2) instrument development or modification for UAS application or (3) UAS observation impact studies, data assimilation experiments or decision support experiments. For projects including laboratory or field demonstrations, describe UAS platform, sensors, and sample mission scenarios to be tested. If applicable, identify total number of missions and flight hours per mission to successfully accomplish project goals and describe the typical decision process for mission planning.

Management Plan – Describe the management structure of the project for overall project coordination, logistics, decision-making, communication, data collection, and data management. Include description of expected procurements, airspace access and clearances, travel, and shipping needs. Include a schedule chart that identifies critical milestones and expected deliverables.

Deliverables – Provide a description of expected deliverables to NOAA including new or modified instruments, platforms, data systems and data sets. Minimum deliverables to the UAS PM and the Office of Marine and Aviations Operation's (OMAO) UAS Operations Lead, should include a Safety and Operations Plan report, Summary of Field Operations report, Summary of Scientific Results report, and Technology Assessment of UAS Concept of Operations for Future Research and Operational Application report.

Key Personnel – Describe key personnel needed to accomplish the project goals including level of effort, organization, and project role for each person in the personnel list. Identify percentage of funding expected from UASP and percentage of other funding expected to support each person.

Comparative Technology Assessment– Describe the anticipated advantages of the UAS technology compared to current observing capabilities - e.g., reduction of size, mass, power, volume or cost, improved performance, or enabling of a new capability not previously possible. Review the current state of the art and relate it to the proposed work. Identify the entrance technology readiness level at the beginning of the project and the expected exit technology readiness level at the conclusion of the project.

Project Risk Mitigation – Describe the major risks to the project success and how they could be mitigated. For each risk, provide a description, how likely the risk could be (high, moderate, and low), the potential impact to the project (great, moderate, and little), and what steps could be taken to mitigate the risk.

Budget Breakdown – Provide a budget breakdown by quarter and for each year for all major project expenses including personnel, platform flight hours, sensors, other hardware, shipping, travel, and data management.

Letter of Commitment – Provide a letter from the Principal Investigator's supervisor stating the organization's commitment to the scope, schedule, budget, and deliverables of the proposed activities.

UAS PROJECT REVIEW TEAM (PRT) PANEL PROCESS

UASP adheres to a panel review process to review Proposals. This part of the *Manual of Procedures* provides information on the steps taken by UASP to conduct proper reviews. Proposals received by UASP as a result of an RFP are subject UAS Project Review Team (PRT) Panel reviews. The PRT Panel will be made up of individuals selected by the UAS PM.

UASP uses the panel review of research proposals as a means to obtain the best available science to achieve its mandate in NOAA. The panel review provides a general assessment and evaluation of how proposals fit within the context of research needs and a comparative overview. UASP uses panel reviews to obtain advice on the merits of proposals and their usefulness in achieving program goals and objectives. Panels are constituted with technical experts from the UASP and subject matter experts when requested by the PM. It is recommended that panels include one or more individuals that are familiar with NOAA's mandates and mission.

Reviewer Instructions

UASP has a set of standardized instructions for proposal reviews. The UAS PM can modify these instructions to fill specific competition needs. These instructions are posted on the UAS Sharepoint site (*see appendix B.1 for details*).

Forms

UASP has adopted a standardized evaluation form that covers all the required evaluation criteria. The form also provides space for reviewers to include additional comments. The form can also be found on the UAS Sharepoint Website (*see appendix B.2*).

UAS Project Review Team (PRT) Panel Responsibilities

The advisory panels for proposal review serve several functions. When a broader range of experience and expertise is required than is represented on the UASP staff, the UAS PM may request external reviewers to supplement the PRT.

The panel members will be expected to have carefully read the proposals being considered by the program, and to write reviews for several proposals. We suggest that you first look through the proposals to get a general idea of the topics to be discussed.

If you are designated as a **primary** reviewer, plan to present a *brief* synopsis of the proposal to the panel (less than 2 min) and lead the general discussion of the proposal (ideally less than 10 min). These overall discussions for a proposal should generally last about 15 minutes. If you think that a short discussion will suffice, please say so at the outset. If other panelists need information in addition to what you provide, they will ask for it. You are asked to write a review for all proposals for which you are a primary discussion leader.

We don't just want input from scientists that are intellectually close to the subject matter. We would like general views on the research; for example, is the proposal's thrust important to marine ecology and management? Is it appropriate that the work be funded by the program? If the proposal is interdisciplinary, does the value of the whole exceed the sum of the parts? Does the research plan seem clear and well organized? Does the PI seem qualified to conduct the research? Are the budget and ship requests reasonable? Is the research indeed compelling? Such evaluations help provide some cross-disciplinary balance to the review process.

One very important fact to keep in mind when preparing for the panel and for the panel evaluations: many meritorious proposals are declined for lack of funds. Any advice you can provide to help us make some of the difficult decisions we make is greatly appreciated. We want to fund proposals that are timely, truly exceptional, and relevant to the NOAA mission.

Confidentiality

Proposals submitted to NOAA are confidential documents. Please do not discuss with anyone the proposals you review. Likewise, please do not discuss the specifics of the panel proceedings with anyone.

PRE-AWARD PROCEDURES

Upon completion of the review process, the UAS PM will place the proposals in rank order and makes recommendations using the rank order, the evaluation, and selection criteria published in the solicitation as the measuring standard to determine the funding of successful proposals (Proposals rated as "Good" or higher that are not funded in the current fiscal period may be considered for funding in another fiscal period without repeating the competitive review process.) Departures from rank order in the recommendation process are allowed but must be based on decision criteria that were posted RFP. Such criteria could be regional priorities, programmatic needs, etc. The PM develops the rank order of proposals from each competition and makes funding recommendations based on the priorities and selection factors, and submits the recommendation memo and ranking spreadsheet to the Office of Oceanic and Atmospheric Administration's, Deputy Assistant Administrator of Laboratory and Cooperative Institutes (DAA/LCI), for review and comment. The DAA/LCI approves or disapproves the selection memo and spreadsheet and submits back to the UAS PM for comment and clearance.

POST-AWARD PROCEDURES

Proposal awards are bilateral agreements. After an award has been signed by the UAS PM it is sent to the applicant for a counter signature. By signing the award, the recipient agrees to abide by the terms and conditions of the award and achieve the scope of work and other activities delineated in the proposal. The program officers along with the award recipients are jointly responsible for project monitoring. Monitoring may take the form of site visits, written and/or oral reports, meetings, or any other form of communication deemed appropriate for keeping apprised of project progress.

PROGRESS REPORTS

The UASP will perform a series of project reviews and programmatic analyses to monitor progress of the project to ensure the terms and conditions of the awards are being fulfilled. The UASP will use the financial reports along with other monitoring activities to measure the progress of each project and keeps abreast of any situations that may prevent the project from being accomplished. Depending on the project requirements, the UASP will oversee Mission Concept Reviews, Preliminary Design Reviews, Critical Design Reviews, Airworthiness and Flight Safety Reviews, Flight Readiness Reviews, Mission Readiness Reviews, and Post Mission Review and Report. The award recipient will be responsible for submitting the financial reports on a semiannual basis to the UASP for review. Any unobligated funds will be returned to the UASP.

Project Monitoring Plan for UAS Program

The purpose of monitoring is not solely to record when recipient problems arise, but also to prove that the agency is responsibly watching over the federal funds it has awarded. The UAS PM is the responsible monitoring official and will develop a monitoring plan for each project before the project begins. The PM will determine the type and frequency of monitoring activities based on the risk assessment of the project and the available resources. Monitoring plan templates can be found in on the UAS Sharepoint site (*see appendix C.1*).

Risk assessments should be developed for each project based on:

- The size and complexity of the project;
- Public and congressional interest of the project;
- Potential hindrances;
- Experience of the recipients and
- Prior problems with the recipient organization

This assessment combined with available resources will determine the frequency of the monitoring activities. The list of possible monitoring activities is below.

- Telephone progress reviews;
- Email progress reviews;
- Annual progress reports;
- Monthly draw down reports;
- Semi-annual (4/30 and 10/31) financial reports;
- Site visits;
- Annual audits;
- Media coverage;
- Internet searches;

The benefits of effective monitoring:

- Ability to tie information obtained during monitoring activities to the progress and financial reports submitted by the recipients.
- Timely assistance can be offered before the project is too far off course; which will ensure the outputs and outcomes are delivered and the projected program goals and objectives are met.

Appendix A.1- RESEARCH FUNDING MECHANISMS

The information detailed on this section is taken directly from the Department of Commerce (DOC), Interim Grants Manual;

1. OVERVIEW:

The DOC has a diverse mission, which is accomplished via both in-house activities and non-Federal organizations, using instruments reflecting either a financial assistance, procurement, or other agreement. These instruments are different in purpose and create different relationships between the Department and outside parties.

The Federal Grant and Cooperative Agreement Act of 1977, as amended, 31 U.S.C §6301-6308, (the Act) requires executive agencies to distinguish procurement relationships from assistance relationships with non-Federal parties and provides some general guidance on helping make these distinctions. The Act requires the use of procurement contracts for all agency acquisition activity, and the use of assistance instruments (grants and cooperative agreements) for specified types of assistance relationships.

This chapter summarizes and augments the guidance in the Act on distinguishing between those situations in which an assistance instrument (grant or cooperative agreements), or other type of agreement is the appropriate instrument.

2. GRANTS

A grant is the legal instrument reflecting a relationship between DOC and a recipient whenever: (a) the Principal purpose of the relationship is to transfer money, property, services, or anything of value in order to accomplish a public purpose of support or stimulation authorized by Federal statute, and (b) no substantial involvement is anticipated between DOC and the recipient during the performance of the contemplated activity.

3. COOPERATIVE AGREEMENTS

A cooperative agreement is the legal instrument reflecting a relationship between DOC and a recipient whenever: (1) the principal purpose of the relationship is to transfer money, property, services, or anything of value to accomplish a public purpose of support or stimulation authorized by Federal Statue, and (2) substantial involvement (e.g., collaboration, participation, or intervention by the DOC in the management of the project) is anticipated between DOC and the recipient during performance of the contemplated activity. See 31 U.S.C.§ 6305. Cooperative agreements are subject to the same laws, OMB, Treasury, and other Federal directives as grants. The following information by be helpful in deciding whether there is substantial involvement in the scope of work of a proposed award.

Appendix A.1- RESEARCH FUNDING MECHANISMS

a. Sections C. and G. of the OMB Guidelines 31 U.S.C.§ 6305 of August 18,1978, describe the characteristics of the factors which each Grants Officer should consider in deciding whether there will be substantial involvement of the organization unit in the performance of activities under the assistance instrument.

b. Listed below are examples of involvement which may be substantial depending upon the circumstances, and examples of situations which would not be considered substantial. The examples are not meant to be a checklist nor does the presence of a single factor necessarily constitute substantial involvement. Rather, they illustrate concepts that, in varying degrees or combinations, could suggest the use of either a grant or a cooperative agreement. For more detailed examples, see the OMB guidelines, Implementation of Federal Grant and Cooperative Agreement Act of 1977 (43 FR 36860).

i. The following are examples of requirements that would demonstrate substantial involvement if they were included in the terms and conditions of a financial assistance award:

(a) Authority to halt immediately an activity if detailed performance specifications (e.g., constructions specifications) are not met.

(b) Stipulation that the recipient must meet or adhere to specific procedural requirements before subsequent stages of a project may continue.

(c) Approval by an appropriate DOC official of substantive provisions of proposed sub awards.

(d) Involvement in the selection of key recipient personnel.

(e) Requirement that the appropriate DOC official (1) collaborate with the recipient by working jointly with a recipient scientist or technician, in carrying out the scope of work, (2) train recipient personnel, or (3) detail Federal personnel to work on the project effort.

(f) Specify direction or redirection of the scope of work due to inter-relationships with other projects, such as requiring recipients to achieve a specific level of cooperation with other projects.

(g) DOC operational involvement during the project to ensure compliance with such statutory requirements as civil rights and environmental protection.

(h) Limitation on recipient discretion with respect to scope of work, organizational structure, staffing, mode of operations and other management process, coupled with close monitoring of operational involvement during performance.

ii. The following are examples of circumstances that would demonstrate non-substantial involvement:

(a) Award follows normal procedures as set forth in 15 CFR Part 14 or 15 CFR Part 24 concerning Federal review of recipient's procurement standards and sole source procurements.

(b) The DOC program and grants administration offices become involved in the project solely to correct deficiencies in project or financial performance.

(c) DOC performs a pre-award survey and required corrective action to enable the recipient to account for Federal funds.

Appendix A.1- RESEARCH FUNDING MECHANISMS

4. NON-COMPETITIVE AWARDS:

a. Discretionary Funds: These awards are made without the benefit of competition. In those instances when noncompetitive awards are recommended for funding, complete and detailed justifications must be submitted by the Program Officer to the Grants Officer for review and approval. Noncompetitive awards using discretionary funds for a new award are allowed in only the following situations:

(i) Future awards under institutional grant programs where the recipient should have been initially selected based on competition. The Program Office must provide to the Grants Officer summary information about the original competition and the date and results of the latest periodic review.

(ii) In instances where an applicant submits an application on its own initiative (not as a result of solicitation by the funding agency), the application does not fall with the scope of a published competitive notice, and the agency determines in accordance with Chapter 8, Section F., DOC Interim Grants and Cooperative Agreement Manual, that the application has merit and falls within one of the six listed categories.

(iii) If more than five percent (5%) of the total number of awards made under a program within one fiscal year are made on the basis of recipient initiative, the Program Officer and the Grants Officer should examine the annual Federal Register notice and make any corrections deemed necessary to the next annual notice so that the solicitation better reflects the goals or needs of the program.

b. Nondiscretionary Funds: Nondiscretionary funds are also referred to as "Congressionally-Mandated" or "Earmarked" funds. The statutory authority is the basis for making awards with nondiscretionary funds. The two types of awards made with nondiscretionary funds are listed below.

(i) Awards Mandated by Statute: These mandatory awards are made to organizations which are specifically named (not just generally described as to type of organization) in a statue and for which funds may be set aside in an appropriations act. The recipient is entitled to the award and has an enforceable right to receive financial assistance. This category does not include projects that are only contained in legislative history.

(ii) Awards Limited by Statute: These awards are made to organizations for which eligibility has been limited by law to a particular class of applicants, every one of which has been notified of the availability of funding, and every applicant that applies and that meets statutory requirements is assured an award (e.g., there may be special language in an appropriations act directing an agency to make awards to every state that applies for funding and meets certain criteria). Included in this category are NOAA programs which are listed in the Federal Register notice, "Guidelines for Nondiscretionary Financial Assistance," as published on April 28, 1994, (59 FR 21959). Depending upon the program and its

legislation, there may be competition among the eligible applicants for additional funding as an incentive for receiving proposals for innovative or pilot/demonstration projects.

5. MULTI-YEAR FUNDING

Multi-year awards are awards which have an award period of more than 12 months of activity. Multi-year awards are partially funded when the awards are approved, and are subsequently funded in increments. The Department encourages long –range program planning for the award and administration of financial assistance actions. One mechanism for facilitating this goal is funding through multi-year awards. This particularly pertains to awards that support research projects that may span several years. One of the purposes of multi-year awards is to reduce the administrative burden on both the applicant and the operating unit. For example, with proper planning, one application can suffice for the entire multi-year award period. It is the Department's policy that the period of activity of multi-year awards should not exceed five years. Grants Officers should establish additional internal policies for consistent selection and approval of programs and awards that may be funded under these multi-year funding procedures

6. COOPERATIVE INSTITUTES

Joint and Cooperative Institutes are formal, collaborative long-term research partnerships established under a Memorandum of Understanding (MOU)/Agreement (MOA) between NOAA through the Office of the Under Secretary of Oceans and Atmosphere and participating universities and non-profit research institutions with programs dedicated to oceanographic and/or atmospheric research, education and outreach. Funds can be transferred to OAR in order to fund a Cooperative Institute.

7. INTER-AGENCY AGREEMENTS

A formal, written agreement between CSCOR and another Federal agency, used to transfer funds to pay for
research conducted by the other agency. The agreement must be approved by both agencies. CSCOR funds can not pay for Federal salaries.

8. INTRA-NOAA FUNDING (BOPS)

Transfer funds directly to other Offices within NOAA to pay for research conducted with academic or non-profit partners. Funds can pay for travel expenses, contracts, and equipment, but not Federal salary.

Appendix B.1- INSTRUCTIONS FOR REVIEWERS

Please provide both written comments and a summary rating on the Proposal Evaluation Form by employing the criteria provided below.

Proposal Evaluation Criteria:
We ask reviewers to use the following five criteria when evaluating a proposal:

1. **Importance and/or Relevance and applicability of proposed project to the program goals: (XX percent):** This ascertains whether there is intrinsic value in the proposed work and /or relevance to NOAA, federal, regional, state or local activities. For the purposes of this competition, [**enter criteria here**].

2. **Technical/scientific merit (XX percent):** This assesses whether the approach is technically sound and/or innovative, if the methods are appropriate, and whether there are clear project goals and objectives. For the purposes of this competition, [**enter criteria here**].

3. **Overall qualifications of applicant (XX percent):** This ascertains whether the applicant possesses the necessary education, experience, training, facilities, and administrative resources to accomplish the project. For the purposes of this competition, [**enter criteria here**].

4. **Project costs (XX percent):** The budget is evaluated to determine if it is realistic and commensurate with the project needs and time-frame. For the purposes of this competition, [**enter criteria here**].

Your ranking should take the form of written comments on the above criteria, with an overall rating having the following characteristics:

- **Excellent:** Probably will fall among the top 10% of proposals in the subfield; highest priority for support. This category should be used only for truly outstanding proposals.
- **Very Good:** Probably will fall among the top 1/3 of proposals in the subfield; should be supported.
- **Good:** Probably will fall among the middle 1/3 of proposals in the subfield; worthy of support.
- **Fair:** Probably will fall among the lowest 1/3 of proposals in the subfield; should not be supported without serious revision.
- **Poor:** Proposal has serious deficiencies; should not be supported.

Appendix B.2 - PANEL REVIEW EVALUATION FORM

A. Proposal Information:

Principal Investigator:	**Panelist ID:**
Institution:	**Proposal Number:**
Proposal Title:	

B. Proposal Evaluation:

For details see "Instructions for Reviewers." Note: boxes will adjust in size as appropriate.

Please evaluate this proposal using the following five criteria.
1. Importance and/or Relevance and applicability of proposed project to the program goals: (XX percent):
2. Technical/scientific merit (XX percent):
3. Overall qualifications of applicant (XX percent):
4. Project costs (XX percent):
5. Outreach/education (XX percent):
Additional Comments:
Rating: ☐ Excellent (5) ☐ Very Good (4) ☐ Good (3) ☐ Fair (2) ☐ Poor (1)
Verbatim but anonymous copies of reviews, ratings, and associated correspondence will be sent to the principal investigator. Subject to this policy and applicable laws, including the Freedom of Information Act (USC 552), reviewers' comments and identities will be given maximum protection from disclosure.

Appendix C.1 - Monitoring Plan

A plan for each project should be developed in advance of the start date. The below template will be used by the UASP.

Program Name:	**Recipient Organization:**
Project Name:	**PI Name:**
Monitoring Activity:	**Frequency:**
Site visits:	
Phone calls:	
Progress Reports:	**Annual:**
Financial Reports:	**Semi-Annual:**
Audits:	**Annual:**
Prior Approvals:	
Other	

Appendix C.2 - Monitoring Activities Record

Program Name:	**Project Name:**
Recipient Organization:	**PI Name:**
Monitoring tool used:	
Reason for Contacting Recipient:	
Results of Conversation/Meeting:	
Next Steps/Recommended Actions (describe any further follow up needed and what the recipient will be expected to do):	
Program Manager: _____	

Appendix C.3 - Suggested Monitoring Questions

Before phone calls, emails or site visits are conducted; the UAS PM should analyze the financial reports, prior approval requests and the current progress of the project to identify the progression towards the approved milestones. In order to capture the current state of the project, the following questions should be asked of the Principal Investigator (PI).

What progress has been made towards meeting the approved milestones?

Is the project staying within the scope of work?

Will there be any changes in the near future that will impact the progress (i.e. PI or key personnel changes, unexpected findings, etc.)?

Does the progress of the project approximately match the pace of the project spending?

If not; why not?

How can future financial information be retailored to approximately match the actual progress of the project?

Are bills paid on a regular schedule or delayed for some reason?

If the pace of the research is slower or faster than originally planned, is this a permanent change to the proposal milestones?

Will more or less funds than originally estimated be needed in the next release?

If yes, what is the new estimate?

	AIRCRAFT OPERATIONS CENTER NOAA Office of Marine and Aviation Operations	CATEGORY 220
		EFFECTIVE DATE April 15, 2012
	AUTHORIZED BY: CAPT Randall J. TeBeest, NOAA Commanding Officer, Aircraft Operations Center	REVIEW DATE March 1, 2013
		RESPONSIBLE Chief, Operations Branch

POLICY 220-1-5

AIRCRAFT OPERATIONS CENTER UNMANNED AIRCRAFT SYSTEMS (UAS) POLICY

1. PURPOSE.

1.1 The purpose of this policy is to provide guidance specific to the operation and management of Unmanned Aircraft Systems (UAS) where differences may exist from the utilization and management of manned aircraft.

1.2 In instances where UAS operations and or management do not differ from manned aircraft, the current Operations policies apply. This policy further prescribes procedures for obtaining flight approval for UAS operations within the National Oceanic and Atmospheric Administration (NOAA).

2. AUTHORITY.

2.1 Current Federal Aviation Administration (FAA) policy identifies UAS as "aircraft" flown by a "pilot" regardless of where the pilot is located. NOAA Administrative Order (NAO) 216-104 mandates that all aircraft operated in NOAA are managed by the Aircraft Operations Center (AOC).

2.2 This policy does not supersede any of the regulations in the Federal Aviation Regulations (FAR) 14 Code of Federal Regulations (CFR) Chapter 1, Federal Management Regulation (FMR) Chapter 102, Part 33, or the Interagency Committee on Aviation Policy (ICAP), which is chaired by the General Services Administration (GSA) and has determined that UAS will be managed the same as manned aircraft under the above FMR.

2.3 Model Aircraft Operations and Government UAS operations.

The FAA has determined that Advisory Circular (AC) 91-57, Model Aircraft Operating Standards, shall not be used as a basis of approval for commercial or government UAS operations and is applicable to recreational and hobbyists use only. All government UAS operations are considered a public aircraft operation and may not be operated under AC 91-57.

3. POLICY.

3.1 Responsibility.

a. While the size, method of control and airspace utilization procedures for UAS may be different than manned aircraft, the overall responsibility for management within NOAA rests with the Office of Marine and Aviation Operations (OMAO). All NOAA UAS operations will be approved by the Commanding Officer (CO), AOC.

b. AOC will:

1. Ensure that UAS operations do not pose unacceptable risks to persons and property.

2. Ensure that UAS operations meet applicable statutory and regulatory requirements.

3. Create a standardized process to review and approve UAS operations.

4. Identify roles and responsibilities consistent with federal regulations.

3.2 Scope.

a. This policy applies to all UAS operations where NOAA holds any responsibility for safety of flight, such as, when NOAA personnel and property are required for the UAS operation or if any NOAA funding is used for the UAS operation.

b. This policy applies to all UAS owned or operated by, or under the auspices of, any NOAA Line Office, Staff Office or any other element within NOAA.

c. The following is a non-inclusive list of operations to which this policy applies:

1. UAS owned by NOAA and/or operated by NOAA personnel.

2. NOAA sponsored UAS missions that require a FAA Certificate of Authorization (COA) to obtain access to the U.S. National Airspace System (NAS).

3. Contractor supported UAS operations where a NOAA employee is participating as an operational member and holds any responsibility for safety of flight.

4. Contractor supported UAS operation funded by NOAA or contracted to collect data that will be used by NOAA in an official capacity.

5. UAS operations aboard a NOAA ship.

6. UAS operations flown in coordination with NOAA aircraft.

d. UAS Operations that do not require review:

1. Demonstration flights where NOAA personnel are observers only.

2. UAS operations conducted by another government agency, when the other agency is responsible for the operation and NOAA assets are not involved.

3.3 FAA regulations governing UAS.

a. For UAS operations in the NAS, FARs currently do *not* specifically address regulations for UAS.

b. However, the FAA has determined that UAS are aircraft and must meet equivalent "see and avoid" requirements as manned aircraft.

c. The FAA has released interim guidance describing how public agencies may gain approval for UAS operations in the NAS. Additional information can be found at http://www.FAA.gov/UAS.

d. UAS flight operations are approved by the FAA on a case-by-case basis. The approval for flight is granted through a COA issued by the FAA. An approved COA is required for UAS operations in the NAS outside Special Use Airspace (SUA), i.e. Restricted, Prohibited or Warning Area airspace.

1. Applications for a COA are submitted to the FAA using an online system where the request describes in detail the UAS and operation being conducted.

2. The COA application includes, but is not limited to, the operations plan, risk management plan, airworthiness statement, airspace requested, pilot qualifications, radio/communication frequencies, and communication plan.

3. AOC is responsible for developing COA applications for NOAA UAS operations. The project's Principal Investigator (PI) is responsible for providing all the required supporting materials and documents.

e. Oceanic UAS flights.

1. UAS flight conducted wholly in offshore warning areas does not require a COA, however, flight approval must be obtained through the warning area controlling agency.

2. UAS flight in Oceanic Flight Information Regions (FIR), where the FAA is the air traffic service provider, requires a COA.

3. For UAS flight in Oceanic FIRs, where the air traffic service provider is a foreign government, coordination and approval with that government is required prior to flight operations commencing. Additional diplomatic clearances may also be required.

3.4 Requirements for UAS flight in Special Use Airspace (SUA), i.e. Restricted, Warning or Prohibited Areas.

a. UAS operations in SUA require the permission of the appropriate authority or controlling agency. UAS operations in these airspaces typically require exclusive scheduling by the agency and may require significant lead-time.

b. Requirements for UAS flight over Military Reservations (not in SUA): the FAA and Department of Defense (DOD) have a Memorandum of Agreement (MOA) to allow certain UAS flight operations over military reservations without the COA requirement.

4. UAS CREW QUALIFICATIONS AND DESIGNATIONS.

4.1 UAS Pilot Qualifications and Certification:

a. General Responsibilities:

The Pilot in Command (PIC) of a UAS is directly responsible for, and is the final authority as to the operation of that aircraft. Supplemental pilots may augment the PIC; however, the PIC retains complete and overall responsibility of the flight, regardless of who may be piloting the aircraft.

b. UAS Pilot Certification Requirements:

1. The requirement for the PIC to hold a FAA Pilot Certificate is based on various factors including the location of the planned operations (i.e. within the NAS or not), mission profile, size of the UAS, and whether or not the operation is conducted within or beyond visual line of sight.

2. Rating requirements for a UAS PIC depend on the type of operation being conducted and fall into two categories:

a) Operations that require at least a FAA Private Pilot Certificate or FAA-recognized equivalent, or

b) Operations that do *not* require a FAA Private Pilot Certificate or FAA-recognized equivalent. Note: Typically operations in this category would permit smaller UAS to operate below certain altitudes while controlled within visual line of sight.

4.2 Regardless of FAA requirements, all NOAA UAS operations identified in Section 3.2 of this policy will require a PIC designation in the platform being operated. The CO, AOC, will only designate NOAA employees as PICs. Non-NOAA PICs (e.g. contractors) will be required to meet the same criteria set forth for NOAA PICs and shall be designated in writing by their contracting vendor or manufacturer; AOC shall receive a copy of the PIC designation prior to flight operations commencing. The following operations require a FAA Pilot Certificate *and* PIC Designation:

a. All operations approved for conduct in Class A, C, D and E airspace.

b. All operations conducted under Instrument Flight Rules (IFR). Note: a FAA Instrument Rating is required for IFR operations.

c. All operations approved for nighttime operations (except SUA).

d. All operations conducted at joint use or public airfields.

e. All operations conducted beyond line of sight (except SUA).

f. All operations above 400 ft Above Ground Level (AGL) or greater than 1NM from the designated project observer (except SUA).

g. At any time the CO, AOC, has determined the need based on the UAS characteristics, mission profile, or other operational parameters.

4.3 Operations that *may only* require a PIC designation, and *not* a FAA Pilot Certificate:

a. Operations in Special Use Airspace (SUA), *or*

b. Operations approved by the CO, AOC, and conducted solely within visual line of sight in Class G airspace and outside of SUA; the PIC is exempt from the FAA Pilot Certificate requirement provided the following conditions are met:

1. In lieu of a FAA Pilot Certificate, the PIC must have successfully completed, at a minimum: FAA Private Pilot ground instruction, passed the FAA Private Pilot written examination within the preceding 24 months, and be designated by the CO, AOC, as a PIC for the specific UAS and project being conducted. However, the nature of the operation, size and complexity of the UAS and geographical location of the SUA will be taken into consideration to possibly determine more restrictive pilot qualifications by the CO, AOC.

2. The operation is conducted in a sparsely populated location.

3. The operation is conducted from a privately owned airfield, military installation, or off-airport location.

4. Visual line of sight operations conducted no further than 1 NM laterally from the UAS pilot and at an altitude of no more than 400 feet AGL at all times.

5. Operations shall be conducted during daylight hours only.

6. Operations shall be conducted no closer than 5 NM from any airport or heliport.

4.4 UAS Pilot Qualifications for Special Use Airspace (SUA).

a. For UAS flights in segregated airspace such as restricted areas, Warning areas, Air Traffic Control Assigned Airspace (ATCAA) and Military Operating Areas (MOAs), and pilot qualifications will be determined on a case-by-case basis by the CO, AOC.

b. The nature of the operation, size and complexity of the UAS and geographical location of the SUA will be taken into consideration for determining pilot qualifications.

4.5 The following table summarizes the rating requirements set forth in sections 4.02 through 4.04:

Airspace	AOC PIC Designation	FAA Private Pilot Certificate	FAA Private Pilot Written Exam only	FAA Class 2 medical	Notes:
NAS	X	X		X	Night operations: currency as per FARs IFR operations: Instrument Rating and currency as per FARs
NAS Class G	X		X	X	Line-of-sight, daylight operations only
SUA/Foreign	X		X		For complex operations, or due to Foreign requirements, additional qualifications may be required by the CO, AOC

4.6 UAS Pilot-in-Command (PIC) Currency and Proficiency.

a. Pilots shall be current in the UAS being operated.

b. At a minimum, the PIC must demonstrate three takeoffs (launch) and landings (recovery) in the UAS in the previous 90 days. If an appropriate simulator is available, currency can be regained using that method. Currency may also be regained under the direct supervision of a qualified and current PIC in the specific UAS. If the above means are unavailable, currency may be regained as specified in the training syllabus for the individual platform.

c. For night operations, the PIC must demonstrate three takeoffs (launch) and landings (recovery) in the UAS at night in the previous 90 days.

d. For operations approved for night or IFR in the NAS, the PIC shall maintain currency per 14 CFR 61.57, Recent Flight Experience, as applicable.

e. In the case of prototype, experimental, or research UAS for which no formal schools are available, the services of the designers and the manufacturer's best qualified personnel shall be utilized to brief and familiarize the UAS pilots with the aircraft, UAS aircraft systems, and ground control stations. In addition, existing UAS simulators and UAS of a similar nature should be used to train pilots prior to flying a UAS research vehicle.

f. Currency requirements that differ from the above will be specified in the UAS-specific training syllabus. Where differences exist, the UAS-specific syllabus will take precedence.

4.7 UAS Pilot-in-Command (PIC) Medical Qualification Requirements.
For operations conducted within the NAS, the PIC shall maintain, at a minimum, a valid FAA Class 2 Medical Certificate issued under 14 CFR Part 67 or the FAA-recognized equivalent.

4.8 UAS Pilot-in-Command (PIC) Training Requirements.

a. UAS pilots will have training in all specific details of the UAS being operated including normal, abnormal, and emergency procedures.

b. This must include manufacturer specific training (or military equivalent, if available), demonstrated proficiency, and testing in the UAS being operated.

c. A training syllabus will be developed for each UAS to document requirements to be met for initial qualification, proficiency, and currency for each pilot. All training will be documented and maintained by the AOC Chief, Training Section.

4.9 UAS Pilot-in-Command (PIC) Designation.

a. Upon successful completion of training, the CO, AOC, will issue a PIC designation letter for NOAA employees only and the letter will be entered into the individual's training jacket at AOC. A PIC designation may be limited in scope to the requirements of the UAS, particular project, and/or operating environment.

b. Instructor Pilot designation for a given UAS, if practicable and/or required, will be issued at the discretion of the CO, AOC.

4.10 Observer Qualifications and Certification:

a. Observer Duties/requirements include but are not limited to:

1. Must have a clear view of the area of operation

2. Be in communications with the PIC either within speaking distance or with a portable radio/cell phone.

3. Keep the PIC advised of any possible hazards such as power lines, birds, other aircraft, obstructions and hazardous weather conditions.

4. An observer can also act as the launch person.

5. May be ground based or within a chase aircraft.

b. Observer Training Requirements.

1. Observers must have completed sufficient training to communicate to the pilot any instructions required to remain clear of conflicting traffic, terrain and obstructions, maintain proper cloud clearances, and provide navigational awareness.

2. This training, at a minimum, shall include knowledge of the rules and responsibilities described in FAR 91.111 (Operating Near Other Aircraft); FAR 91.113 (Right-of-way rules: Except water operations); and FAR 91.155 (Basic Visual Flight Rules (VFR) weather minimums); knowledge of air traffic and radio communications, including the use of approved ATC/pilot phraseology; and knowledge of appropriate sections of the Aeronautical Information Manual (AIM).

c. Observer Medical Qualification Requirements:

1. For UAS flight in SUA: as required by the CO, AOC.

2. When an observer is required by the provisions of the issued FAA COA, the observer shall maintain, at a minimum, a valid FAA Class 2 medical certificate issued under 14 CFR Part 67, and have it in their possession.

5. MAINTENANCE AND AIRWORTHINESS.

5.1 Maintenance.

a. The PIC will ensure the aircraft has been inspected and maintained in accordance with the manufacturer's procedures and/or FAA UAS guidelines or AOC Maintenance Instructions. Note: Many small UAS (sUAS) typically operate on a "fly to failure" maintenance schedule.

b. Flight critical parts will be inspected at least once per day prior to flight activities (normally accomplished during the first preflight of the day).

c. The Maintenance Branch will develop an appropriate maintenance inspection schedule for critical components based on the UAS manufacturer's guidance. Note: the FAA has no official guidance at this time governing the maintenance of UAS.

d. Individual aircraft logbooks for each UAS will be maintained by the Maintenance Branch. At a minimum, these logbooks shall include flight hours, inspection intervals, component times, time life items (such as batteries), as well as any malfunctions such as lost link, damage of parts, and serial numbered parts that require replacement.

e. A preflight inspection must be performed by the PIC per the manufacturer's guidelines.

5.2 Radio Spectrum Usage Requirements

Each UAS operation must have appropriate approval for radio spectrum usage through NOAA's Office of Radio Frequency Management prior to operations commencing.

5.3 Airworthiness.

The UAS must be shown to be airworthy for the specific operation being conducted. Unlike manned aircraft, the airworthiness requirements for UAS are dependent on the operational requirements of the UAS (for example, certain Unmanned Aircraft may purposely terminate flight to gather certain data in a way that does not harm persons or property).

5.4 Airworthiness Statement.

An Airworthiness Statement will be provided prior to commencing any NOAA UAS operation. AOC's Science and Engineering Branch (SEB) will make the final determination of whether or not the UAS has sufficient airworthiness substantiation and will be responsible for generating Airworthiness Statements for approval by the CO, AOC. At a minimum, UAS Airworthiness Statements will include: the date or dates of effectiveness and any warnings or limitations.

5.5 Flight Clearances or Airworthiness determinations from other agencies such as NASA, Naval Air Systems Command (NAVAIR), and other DOD agencies may be used by SEB to show airworthiness justification. Typically, mature UAS have gone through an airworthiness process of some kind. Additionally, there are various civilian and DOD groups that can be utilized to provide airworthiness justification.

5.6 Examples of acceptable airworthiness policy/criteria include, but are not limited to:

a. DOD: MIL-HDBK 516B, Airworthiness Certification.

b. Air Force: AFPD 62-6, United States Air Force (USAF) Aircraft Airworthiness Certification.

c. Army: AR 70-62, Airworthiness Qualification of US Army Aircraft Systems (Level 1).

d. Navy and Marine Corps: NAVAIRINST 13034.1C, Flight Clearance Policy for Air Vehicles and Aircraft Systems.

e. National Aeronautics and Space Administration (NASA) Dryden Handbook DHB-X-001, Airworthiness and Flight Safety Review.

5.7 Continued Airworthiness

Continued airworthiness is shown through complying with documented procedures to ensure that inspections and maintenance to the UAS are conducted. UAS logbook entries shall be maintained per manufacture guidelines to demonstrate continued airworthiness.

6. FLIGHT APPROVAL PROCEDURES.

6.1 UAS Flight Readiness Review (FRR) Board

a. All NOAA UAS operations will be approved by the CO, AOC. Section 3.2 lists types of operations requiring an FRR. Other types of UAS operations may require a FRR Board at the discretion of the CO, AOC.

b. The FRR Board will include at a minimum, representatives from AOC's Operations, Safety, SEB, and Maintenance Branches. The CO, AOC, will designate a chairman for the FRR Board. The primary UAS Officer at AOC will be the secretary of the FRR Board and make arrangements for reviews and ensure the PI is appropriately prepared.

c. The FRR Board shall review the UAS flight request and make recommendations to the CO, AOC. The project's PI will provide a briefing to the FRR Board (in person or via telephone conference). Copies of the briefing material should be made available to the board one week prior to the scheduled Board date.

d. The FRR Board will focus on, but is not limited to, the following areas:

1. Operation Risk Management (ORM) / hazard analysis and mitigations.

2. Operations Plans, Cruise Plans (if required) and Airspace / Safety Plans.

3. Emergency Procedures (to include incident notification).

4. COA provisions.

e. Flight Approval

1. A NOAA UAS Flight Authorization Letter, signed by the CO, AOC, is required prior to commencing any UAS operation.

2. UAS flights will be approved for a specific flight envelope. This may include restrictions on weather, daylight, dates, airframe, location, or other operational restrictions.

3. Changes to the flight approval may require an updated operations plan, ORM and other materials as appropriate. The CO, AOC, has the discretion to request an additional FRR Board to review changes and reissue a modified Flight Authorization Letter.

6.2 UAS Flight Reporting Requirements.

a. Once an operation has been approved, the project shall provide daily flight information in accordance with normal AOC aircraft and project reporting requirements (i.e. Sitreps, flight logs, expense reports, maintenance discrepancies, etc.).

b. Any incidents or mishaps shall be reported using the procedures described in AOC Operations Policy 220-1-4.

c. AOC's Chief, Safety Standardization and Training Branch will determine how incident investigations will be conducted in accordance NOAA, OMAO, and AOC procedures.